



Potential impact of climatic variations on Forest Fire severity in Lebanon

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Forest Fire (FF) in the Mediterranean in general and Lebanon in particular has witnessed an increase in severity and frequency in the last decades. It has grown into one of the main natural hazards that threaten both the natural and human environments. Forest areas in Lebanon have decreased from 35% in 1960 to 13% in 2010 indicating a 22% decrease in 50 years only. Given that forests are particularly sensitive to climatic variations because of the long life-span of trees which does not allow for rapid adaptation to environmental changes, climatic factors causing prolonged droughts were observed using two different methods to ensure a strong basis for correlation since climatic impact is still a generally controversial issue. i- The Reconnaissance drought Index (RDI) which is a Mediterranean based index proposed for the assessment of meteorological drought severity based on cumulative values of precipitation and potential evapotranspiration was used to develop the yearly drought index trend. ii-The Normalized Difference Vegetation Index (NDVI), which is considered as an indicative remotely sensed drought index, was also used in an attempt to find a correlation between these variations and FF severity. Moreover, the Burn severity was assessed using Normalized Burn Ratio (NBR) in order to localize the high and moderate burned areas and to trace the yearly burned severity variables. This paper utilizes remotely sensed data of MODIS and Landsat to compare the NBR values with their corresponding yearly NDVI and RDI over the watershed of Damour River. Preliminary results showed a strong positive correlation $r=0.713$ between RDI and NDVI. NDVImax tends to increase suggesting more vegetation when RDI value is positive suggesting a wet year. On the other hand, NBRmax values tend to decrease when RDI shows a wet year (positive values) and tends to increase when RDI shows a dry year (negative values) giving a moderate inverse correlation $r= -0.63$. These results substantiate the relationship between NBR forest fire severity and NDVI and RDI climatic variations.